Yarmouk University
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Effect of Capital Structure on Value of the Firm: An Empirical Study on the Non-Financial Services Companies Listed in Amman Stock Exchange 1998-2007

أثر هيكل رأس المال على قيمة الشركة:
دراسة ميدانية على شركات الخدمات غير المالية المدرجة في سوق عمان المالي
2007-1998

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Thesis submitted in partial fulfillment of the requirements for the degree of Master in banking and finance

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Effect of capital structure on value of the firm:
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Dedication

This thesis is dedicated to **my wonderful parents**, who have raised me to be the person I am today. You have been with me every step of the way, through good times and bad. Thank you for all love, guidance, and support that you have always given me. Thank you for everything. I am honored to have you as my parents. I love you so much!

To my **dearest sisters** (Sarra and Fayza), and **my brothers** (Zakari and Belkacem), who always stressed on importance of a high level of education and who helped me to achieve it. I hope that you will walk again and be able to fulfill your dreams. Thank you from the bottom of my heart.

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Abstract

Amina Hammada. Effect of capital structure on value of the firm: An empirical study on the non-financial services companies listed in Amman Stock Exchange 1998-2007. Master thesis, Department of Finance and Banking, Yarmouk University. 2010 (Supervisor: Prof. Ali. H. Magableh).

In the context of corporate finance, using of debt makes tax saving, this means that it is better for the firms to finance with debt rather than equity, but there is a high risk associated with high debt level in terms of insolvency and bankruptcy, so, firms should choose the optimal capital structure which increases their market value.

This study aimed to investigate the effect of capital structure on the value of the firm. It has sampled eighteen non-financial services companies listed in Amman stock exchange for a period of one decade that is from 1998 to 2007.

We use a multiple linear regression model to examine the relationship between a dependent variable which is the firm value and an independent variables which are: capital structure, profitability of the firm, growth of the firm, firm's size, and income tax rate.

Empirical findings indicated existence of negative and significant relationship between the firm value and the capital structure; this indicates that extensive use of debt affect negatively the market value of the firm, which means that these firms are not able to realize the benefits of using debt. Also the results show a positive and significant relationship between firm value and the size of the firm which indicates that the firm use its total assets effectively to increase its value.

This study recommends that the non-financial services companies listed in Amman stock exchange, should take into consideration the main factors that affect their market value.

Key words: capital structure, firm value, non-financial services companies,

Amman Stock Exchange.

Chapter One

Introduction

1-1 Preface

1-2 Problem Statement

1-3 Objective of the Study

1-4 Importance of the Study

1-5 Hypotheses of the Study

1-6 Methodology of the Study

1-7 Structure of the Study

1-1 Preface

During the last fifty years or so, the role of financial management has undergone a tremendous change. The ownership structure, size of business firms, security markets, financial system and instruments have been greatly changed. As a result, the role of finance manager has become far more important than merely a fund raiser.

The finance manager is expected to maximize the economic welfare of the owners, which is represented by the market value of the firm. To achieve this objective, one has to take a number of decisions, the most important being are investment, financing and dividends decisions.

Firms achieve the goal of stockholders wealth maximization through mixing the permanent sources of funds used by them. Capital structure decision is a significant managerial decision, which influences risk and return of the investments projects. Company will have to plan its capital structure at time of its establishment. Whenever the company needs to change its capital structure, it involves a capital structure decision because it has to determine the way of capital structure changes.

A firm can determine its own capital structure; a decision regarding the composition of it's capital, normally refers to a choice of debt and equity. It can raise money to invest its assets by issuing more debt than equity. It can also change the mix of debt and equity by issuing more equity and using the proceeds to buy back some of it's debt. If the goal of decision of

capital structure is to make the firm as valuable as possible then the firm should decide an appropriate debt-equity ratio. A large number of theoretical and research papers have studied capital structure in the past decades. However, there is still no unambiguous solution for the optimal capital structure of the firm.

The capital structure theory is concerned with the question of whether the choice of debt to total assets or, alternatively, the proportion of debt to equity–affects firm value or the average cost of capital. If it determines that the debt ratio has no bearing on firm value or on the cost of capital, then the question of capital structure choice is irrelevant –one capital structure is as good as another. In this case, firms need not concern themselves with what debt ratio to equity. So, they can choose a debt ratio at random and it will be as good as any. On the other hand, if it is determined that the debt ratio has an effect on firm value or on the cost of capital, it would be in the firm's interest to find out which specific capital structure would maximize firm value or minimize the cost of capital.

This study investigates the relationship between capital structure and firm value for non-financial services companies listed in Amman Stock Exchange (ASE) during the period from 1998 to 2007.

1-2 Problem Statement

Any financial management seeks through its decisions, whether those related to finance, investment and others, to achieve a strategic goal, which is profit maximization. But this goal alone is not sufficient, where the firm value maximization became the main objective pursued by the company.

In the context of corporate finance, using of debt makes tax saving, this means that it is better for the firms to finance with debt rather than equity, but there is a high risk associated with high debt level in terms of insolvency and bankruptcy. So, firms should choose the optimal capital structure which increases their market value.

Relative to the above concern, this study aims to answer the following questions:

- What is the capital structure of non-financial services companies listed in ASE?
- Does the capital structure affect the value of the firm? If so, is it a positive or negative effect?
- Is there any relationship between firm's value and independent variables included in this study such as: firm's profitability, firm's growth, firm's size, income tax rate?

This study was selected for many reasons:

- Most studies conducted about the effect of capital structure on firm value were from developed countries, such as, Connell and Servaes, 1995(New York), Kaifeng, 2002 (Netherlands), Carpentier, L'her and Suret, 2002 (France), Oraluck and Ariff, 2004 (Australia), ...etc
- There were few studies on the effect of capital structure on firm value from developing countries, compared to developed countries, such as, Sarma and Hanumanta, 1967 (India), Eldomiaty, 2004 (Egypt), ...etc
- The service sector (non-financial) in Jordan is one of the vital economic sectors, which is attractive to investors. The service sector in Jordan contributed by 63% in 2008[1] to the Gross Domestic Product (GDP).
- Service sector in ASE has an important share of value traded. The following table represents the value traded (JD) in ASE during the period (1978-2006).

[1] http://devdata.worldbank.org/AAG/jor_aag.pdf

Table (1-1): Trading Value at the First and Second Markets by Sector

Year	Banking	Insurance	Services	Industry	Total
1978	1,909,388	211,581	605,792	2,889,130	5,615,891
1979	6,837,164	932,825	1,315,201	6,757,969	15,843,159
1980	17,339,167	931,044	5,944,764	17,216,101	41,431,076
1981	28,903,515	6,619,151	7,828,845	32,065,516	75,417,027
1982	54,198,621	13,553,451	18,552,277	41,984,614	128,288,963
1983	95,726,894	6,534,397	16,634,169	22,531,651	141,427,111
1984	34,387,848	2,642,570	6,243,573	16,044,632	59,318,623
1985	47,429,847	2,574,124	3,766,969	12,959,932	66,730,872
1986	39,719,883	4,212,281	4,610,438	20,980,391	69,522,993
1987	40,735,013	7,404,634	6,297,346	93,741,300	148,178,293
1988	42,273,622	3,098,922	9,459,852	77,792,826	132,625,222
1989	86,698,562	7,841,808	32,713,056	240,336,414	367,589,840
1990	71,177,094	6,422,945	30,840,497	160,445,437	268,885,973
1991	75,523,292	4,794,580	35,435,609	187,083,248	302,836,729
1992	202,807,731	25,309,246	128,018,415	530,815,591	886,950,983
1993	282,551,879	32,946,207	127,939,623	525,176,093	968,613,802
1994	186,791,403	7,845,031	91,257,939	209,181,679	495,076,052
1995	149,619,498	7,364,131	110,160,986	151,813,929	418,958,544
1996	83,095,667	3,105,991	51,029,859	111,351,827	248,583,344
1997	165,445,904	4,528,160	55,220,936	130,049,623	355,244,623
1998	192,664,521	5,931,034	46,979,741	218,798,972	464,374,268
1999	128,121,996	7,618,634	50,800,991	202,934,713	389,476,334
2000	128,555,301	4,143,961	54,073,563	101,023,712	287,796,537
2001	300,276,414	6,220,168	92,935,515	262,934,343	662,366,440
2002	349,776,183	11,418,714	114,074,787	471,434,261	946,703,945
2003	524,838,111	39,141,702	440,921,031	850,275,166	1,855,176,011
2004	1,692,995,377	43,427,020	1,000,692,488	1,056,136,165	3,793,251,050
2005	6,043,405,201	179,878,428	8,003,977,852	2,643,790,467	16,871,051,948
2006	2,870,080,566	89,032,967	9,233,082,106	2,017,674,953	14,209,870,591

Resource: http://www.ase.com.jo/en/trading-value-first-and-second-markets-sector

- This study covers the last decade from 1998 to 2007, where the service sector has known a continuous increase in the value traded.
- We select the period from 1998 to 2007 in order to analyzing the recent trends in capital structure and firm's value of non-financial services companies listed in ASE.

1-3 Objective of the Study

The basic objective of this study is to empirically investigate the impact of capital structure on firm value for non-financial services companies listed in ASE during the period from 1998 to 2007.

1-4 Importance of the Study

As already mentioned, the most important objective of the firm management is to achieve maximization the firm's value which might be affected by the capital structure. The importance of this study is to demonstrate that impact of capital structure on non-financial services companies listed in ASE which could help financial managers to identify an optimal capital structure which maximizes firm value.

This study is important since it helps in analyzing the recent trends in capital structure and firm's value of non-financial services companies listed in ASE.

1-5 Hypotheses of the Study:

The main hypotheses of this study are:

H_0: There is a statistically insignificant relationship between capital structure and firm value.

H_1: There is a statistically significant relationship between capital structure and firm value.

In addition, this study tests the following sub hypotheses:

H_2: There is a statistically significant relationship between firm's profitability and firm's value.

H_3: There is a statistically significant relationship between firm's growth and firm's value.

H_4: There is a statistically significant relationship between firm's size and firm's value.

H_5: There is a statistically significant relationship between income tax rate and firm's value.

1-6 Methodology of the Study

This study used the multiple regression analysis to examine the relationship between the dependent variable which is value of the firm and several independent variables which are: capital structure, firm's profitability, firm's growth, firm's size, income tax rate.

The population of the study includes all non-financial services companies listed in ASE during the period from 1998 to 2007.

1-7 Structure of the Study

The structure of this study consists of six chapters organized as follow:

Chapter one provide general framework of the study. Chapter two introduces theoretical background such as: capital structure theories,

determinants of capital structure...etc. Chapter three reviews the major studies conducted about the relationship between capital structure and firm value. In chapter four we will outline the methodology of the study, which was implemented to define the variables and instrument used to analyze their relationships according to our hypothesis. In chapter five we will analyze the data. Finally, chapter six reports the results of the research and suggests recommendations.

Chapter Two

Theoretical Background

2-1 Introduction

2-2 Debt versus Equity: Advantages and Disadvantages

2-2-1 Advantages of Debt compared to Equity

2-2-2 Disadvantages of Debt compared to Equity

2-2-3 Can a Firm Finance its Capital with 100% Debt?

2-3 Main Theories in Capital Structure

2-3-1 Modigliani-Miller Models

2-3-2 Hamada Model (1969): Introduction to Market Risk

2-3-3 Miller Model (1977)

2-4 Determinants of Capital Structure

2-1 Introduction

This study will provide firstly the components of capital structure, their advantages and disadvantages. Secondly it presents the main theories conducted about the capital structure and its effect on firm value. Finally it summarizes the most important factors that affect capital structure decision from previous studies on this subject.

2-2 Debt versus Equity: Advantages and Disadvantages[1]

In order to expand, it is necessary for business owners to tap financial resources. Business owners can utilize a variety of financing resources, initially broken into two categories, debt and equity. "Debt" involves borrowing money to be repaid, plus interest. "Equity" involves raising money by selling stocks of the company. The following part discusses the advantages and disadvantages of debt financing as compared to equity financing.

2-2-1 Advantages of Debt compared to Equity:

- Because the lender does not have a claim to equity in the business, debt does not dilute the owner's ownership interest in the company.
- A lender is entitled only to be repayed an agreed-upon principal of the loan plus interest, and has no direct claim on future profits of the

[1] http://smallbusiness.findlaw.com/banking_financing/be1_5debtvsequity.html

business. If the company is successful, the owners reap a larger portion of the rewards than if they to share it with debt holders.

- Except in the case of variable rate loans, principal and interest obligations are known amounts which can be forecasted and planned for.
- Debt holders have no voting rights in the company.
- Interest on the debt can be deducted from the company's tax return, lowering the actual cost of the loan to the company.

2-2-2 Disadvantages of Debt compared to Equity:

- Unlike equity, debt must at some point be repaid.
- Interest on debt is a fixed cost which raises the company's break-even point. High interest costs during difficult financial periods can increase the risk of insolvency. Companies that are too highly leveraged (that have large amounts of debt as compared to equity) often find it difficult to grow because of the high cost of servicing the debt.
- Cash flow is required for both principal and interest payments and must be budgeted for. Most loans are not repayable in varying amounts over time based on the business cycles of the company.
- Debt instruments often contain restrictions on the company's activities, preventing management from pursuing alternative financing options and non-core business opportunities.

- The larger a company's debt-equity ratio, the more risky the company is considered by lenders and investors. Accordingly, a business is limited as to the amount of debt it can carry.
- The company is usually required to pledge assets of the company to the lender as collateral, and owners of the company are in some cases required to personally guarantee repayment of the loan.

2-2-3 Can a Firm Finance its Capital with 100% Debt?

The answer is no because of the following reasons:

- **Bankruptcy Costs:**

The costs of bankruptcy discussed in the literature are of two kinds, direct and indirect. Direct costs include lawyer's and accountants' fees, other professional fees, and the value of the managerial time spent in administering the bankruptcy. Indirect costs include lost sales, lost benefit, and possibly the inability of the firm to obtain credit or to issue securities except under especially onerous terms[1].

[1] Jerold B.Warner, " Bankruptcy costs: some evidence ", Journal of finance, Vol.32, Issue2, p. 337-347, (May, 1997).

- **Trade-off Theory:**

Research following the Modigliani-Miller (MM) papers led to Trade-off theory of leverage. In which trade off the benefits of debt financing against higher interest rates and bankruptcy costs. A summary of the trade-off theory is expressed graphically in figure (2-1) page 15, and here are some observations about the figure:

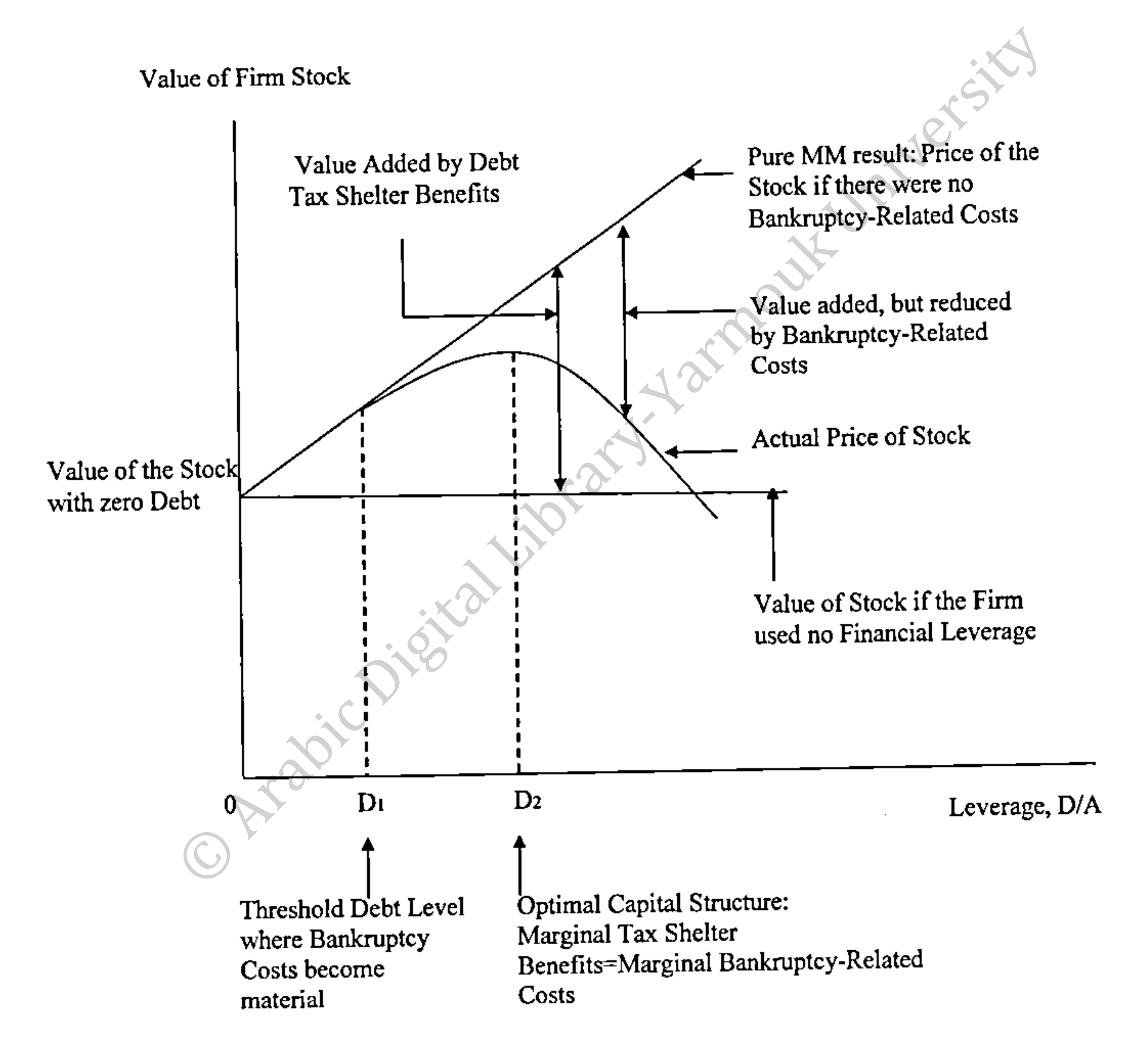
a. In reality, firms rarely uses 100% debt, one reason is the favorable personal tax treatment of income from stocks, also, the primary reason is that firms limit their use of debt to reduce the probability of financial distress (bankruptcy).

b. There is some threshold level of debt, labeled D_1 in figure (2-1), which the probability of bankruptcy is so low as to be immaterial. Beyond D_1, however, bankruptcy related costs and rising interest rates become increasingly important, and they reduce the tax benefits of debt at an increasing rate.

   In the range from (D_1 to D_2), bankruptcy related costs reduced but to not completely offset the tax benefit of debt, so the firm's stock price rises at a decreasing rate as its debt ratio increases.

   Beyond D_2, bankruptcy related costs exceed the tax benefit, so from this point on increasing the debt ratio lowers the value of the stock. Therefore, D_2 is the optimal capital structure.

Figure (2-1): Effect of Leverage on the Value of the Firm Stock.



Source: J.Fred Weston, Scott Besly, Eugene F.Brigham, " Essentials of Managerial Finance ", Eleventh edition, United States of America, p. 631, 1996.

c. Even it is not shown in figure (2-1), there is a relationship between the firm's stock prices and its weighted average cost of capital. As the firm uses more and more debt, its weighted average cost of capital first decreases, then reaches to a minimum and finally begins to rise. Moreover, the minimum weighted average cost of capital occurs where the stock price is minimized, at point D_2 in figure (2-1).

In summation, the same capital structure that maximizes the stock price also minimizes the overall cost of capital.

d. Both theoretical and empirical evidence support this discussion, but statistical problems prevent precisely identifying points D_1 and D_2 so curves must be taken as approximations.

e. A distributing empirical contraction to capital structure theory as expressed by figure (2-1) is the fact that many large companies use far less debt than the theory suggests, that led to the development of the signaling theory.

- **Signaling Theory[1]:**

One of the MM's assumptions is that investors and managers have the same information about the firm's prospects, which is called symmetric information. However, managers often have better information than outside investors, this is called asymmetric information, and it has an important effect on capital structure.

In asymmetric information, firms with extremely good prospects prefer to finance with debt because they would not have had to share profit of the new investment with new investors. Whereas, firms with poor prospects like to finance with stocks which would mean bringing in new investors to share the losses. Therefore, the announcement of stock offering of a mature firm that has financing alternatives is taken as a signal that the firm's prospects as seen by its management are not bright.

In normal times, maintaining a reserve borrowing capacity which can be used in the event that some especially good investment opportunity comes along. This means that firms in normal times should use less debt than is suggested by the trade-off theory.

[1] Mohammad al-Momani, " The effect of capital structure changes on firm value under different risk levels: evidence from Jordanian market ", Master thesis, Faculty of Economics and Administrative Science, Yarmouk University, Irbid, Jordan, p.16, 2006.

As a result, these capital structure theories can be combined to reason the behavior of firms. First, firms will employ some debt financing due to the tax deductibility of interest. Next, there is a limit to the amount of debt usage a firm will have because of financial distress and agency costs. Also, firms may maintain a reserve so they can take advantage of good investment opportunities without needing to issue new stock (asymmetric information).

Conclusion

Investment projects of companies usually require both debt and equity. The optimal ratio needs to be carefully determined for each individual situation. It is unlikely that this ratio will consist of 100% equity or 100% debt. If the long-term prospects are so poor that a company can never make sufficient profits to benefit from leverage then the opportunity is probably not worth pursuing. Conversely, relying on100% debt financing often places a heavy cash drain on companies and leads to sub-optimal growth. Debt and equity financing should not be seen as substitutes for each other. Instead, they are very different in nature and complement each other. Debt needs to be repaid in cash. Equity needs to be rewarded with long-term profits. Depending on individual circumstances and opportunities the trick for each investment is to find the best mix of both[1].

[1] http://www.dynamic-equity.com/vcmag03.htm

2-3 Main Theories in Capital Structure:

2-3-1 Modigliani-Miller Models:

In 1958, two prominent financial theorists, Franco Modigliani and Merton Miller (MM), showed that under certain assumptions, firm value and average cost of capital are independent of the firm's capital structure. They were the first to undertake a formal analysis of the capital structure question using a scientific approach. Basically what they did was to compare the value and cost of capital of two firms identical in every respect except for one feature: one firm had no financial leverage while the other had some debt in its capital structure. In developing their theoretical model, MM listed several assumptions[1].

Assumptions[2]:

MM provide the following assumptions, some of which were later relaxed.

1) There are no personal or corporate taxes.
2) Business risk[3] can be measured by standard deviation of the operating income (EBIT), and firms with the same degree of risk are said to be in a homogeneous risk class.

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1 Moyer, McGuigan, Rao, " Fundamentals of Contemporary Financial Management ", Second edition, United States of America, p. 419, 2007.

2 Basil Al Najjar, " Determinants of capital structure (new evidence from Jordanian panel data) ", Master thesis, Faculty of Economics and Administrative Science, Yarmouk University, Irbid, Jordan, p. 14, 2003.

3 Business risk: is the risk of the firm's operations if it uses no debt. It is defined also as the risk associated with projections of a firm's future returns on assets (ROA), or returns on equity (ROE) if the firm uses no debt.
J.Fred Weston, Scott Besly, Eugene F.Brigham, " Essentials of Managerial Finance ", p. 610.

3) Stocks and bonds are traded in a perfect market, that implics that there are no brokerage costs, and investors can borrow at the same rate as corporations.
4) Investors have homogeneous expectations about expected future corporate earnings and the riskiness of those earnings.
5) The debt of firms and individuals is riskless, so interest rate on all debt is the risk-free rate.
6) All cash flows are perpetuities[1], that is, all firms expect zero growth (Modigliani and Miller 1958).

A. MM Model without Taxes (1958)[2]:

MM first performed their analysis under the assumption that there are no corporate or personal income taxes. On the basis of preceding assumptions, and in the absence of corporate taxes, MM stated and proved algebraically two propositions:

Proposition 1:

The value of any firm is established by capitalizing its earning before interest and tax (EBIT) at a constant rate (K_{su}) which is based on the firm's risk class and can be defined as cost of equity of unlevered firm:

1 Perpetuity: a stream of equal payments expected to continue forever.
J.Fred Weston, Scott Besly, Eugene F.Brigham, " Essentials of Managerial Finance ", p. 252.

2 Eugene F. Brigham, Louis C. Gapenski, " Financial management: theory and practice ", Seventh edition, United States of America, p. 532, 1994.

$$V_L = V_U = \frac{EBIT}{WACC} = \frac{EBIT}{K_{su}} \text{..........}(2-1)$$

Where:

V_L: Value of levered firm.

V_U: Value of unlevered firm.

K_{su}: cost of stock of unlevered firm.

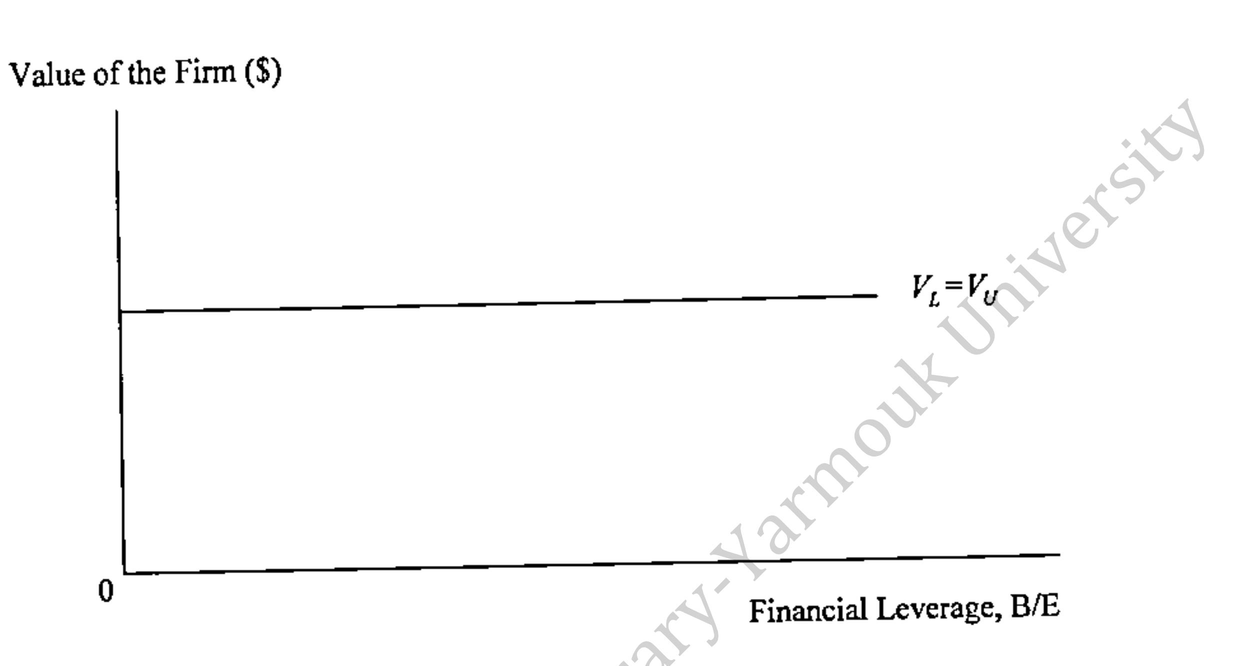
$WACC$: weighted average cost of capital.

EBIT: earning before interest and tax.

According to MM proposition 1, the value of the firm is invariant to the financial leverage assumed by the firm. Regardless of how little or how much debt the firm chooses to have, that act alone cannot affect the value of the firm. MM argue that firm value stems from the earnings generated from the assets owned. Because changing the capital structure (debt-equity ratio) does not affect the assets structure of the firm, the earnings are unaffected; consequently, firm value is unaffected[1]. (This proposition is illustrated in figure (2-2)).

[1] Moyer, McGuigan, Rao, " Fundamentals of Contemporary Financial Management ", p. 420.

Figure (2-2): Graphic representation of MM theory with no corporate income tax: Effect on firm value



Source: Moyer, McGuigan, Rao, " Fundamentals of Contemporary Financial Management ", p.421.

Under MM model when there are no taxes, the value of the firm is independent of its financial leverage this implies that:

- The weighted average cost of capital to the firm is completely independent of its capital structure.
- The weighted average cost of capital for the firm regardless of the amount of debt it issues, is equal to the cost of equity it would have if it used no debt.

Proposition 2:

The cost of equity of a levered firm (K_{SL}), is equal to the cost of equity of unlevered firm (K_{SU}) plus a risk premium whose size depends on both the differential between unlevered firm's cost of debt and equity and the amount of debt used.

$$K_{SL} = K_{SU} + \text{Risk premium}$$

$$K_{SL} = K_{SU} + (K_{SU} - K_d)\frac{D}{S} \quad \text{..........}(2-2)$$

Where:

K_d: Constant cost of debt.

D: Market value of debt.

S: Market value of the firm's equity.

Taken together, the two MM propositions imply that the inclusion of more debt in capital structure will not increase the value of the firm, because the benefits of the cheaper debt will be exactly offset by an increase in its riskiness.

Thus, MM argue that in a world without taxes, both the value of the firm and its weighted average cost of capital would be unaffected by its capital structure.

B. MM Model with Corporate Taxes (1963):

In 1963, Modigliani and Miller published a revision of their original paper, this time they corporated the effect of corporate income taxe. With corporate income taxes in place, MM find that the value of the levered firm is equal to that of an otherwise equivalent unlevered firm plus the tax shield benefit from debt[1].

Here are the MM propositions when corporations are subject to income taxes[2]:

Proposition 1:

The value of the levered firm is equal to the value of unlevered firm in the same risk class (V_U) plus the gain from leverage. The gain of leverage is the value of the tax saving, which is found as the product of corporate tax rate times the amount of debt the firm uses:

$$V_L = V_U + T * D \text{..........} (2-3)$$

$$V_U = \frac{EBIT(1-T)}{K_{SU}}$$

Where:

T: Corporate tax rate.

D: Debt amount.

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1 Moyer, McGuigan, Rao, " Fundamentals of Contemporary Financial Management ", p. 422.

2 Eugene F. Brigham, Louis C. Gapenski, " Financial management: theory and practice ", p. 535.

Proposition 2:

The cost of equity to a levered firm is equal to the cost of equity to unlevered firm in the same level of risk plus a risk premium whose size depends on the differential between the cost of equity and debt to an unlevered firm, the amount of financial leverage used, and the corporate tax rate:

$$K_{SL} = K_{SU} + (K_{SU} - K_d)(1-T)\frac{D}{S} ....(2-4)$$

Proposition (2), coupled with the fact that taxes reduce the effective cost of debt, is what produces proposition (1) result namely that the firm's value increases as its leverage increases .

2-3-2 Hamada Model (1969): Introduction to Market Risk

Robert Hamada combined the Capital Asset Pricing Model (CAPM) with MM after tax model to obtain an expression for K_{SL}, the cost of equity of leverage firm, to do that he added a financial risk premium:

K_{SL} = Risk free rate + Business risk premium + financial risk premium

$$K_{SL} = K_{rf} + (K_m - K_{rf})\beta_u + (K_m - K_{rf})\beta_u(1-T)\frac{D}{S} ....(2-5)$$

Where:

K_{rf}: Risk free rate.

K_m: Rate of return on the market.

β_u: Beta coefficient that the firm would have if the firm uses no financial leverage.

Hamada also showed that equation (2-5) can be used to derive another equation that analyses the effect of leverage on beta.

Knowing that the security market line (SML) equation is equal to:

$$SML: K_s = K_{rf} + \beta(K_m - K_{rf}) \text{..........} (2-6)$$

Now by equating equation (2-5) and equation (2-6), then:

$$K_{rf} + (K_m - K_{rf})\beta_u + (K_m - K_{rf})\beta_u(1-T)\frac{D}{S} = K_{rf} + \beta(K_m - K_{rf})$$

$$(K_m - K_{rf})\beta_u + (K_m - K_{rf})\beta_u(1-T)\frac{D}{S} = \beta(K_m - K_{rf})$$

$$\beta = \beta_u + \beta_u(1-T)\frac{D}{S}$$

$$\beta = \beta_u\left[1 + (1-T)\frac{D}{S}\right] \text{..........} (2-7)$$

Thus, under the MM and CAPM assumptions, the equity beta of any firm is equal to the equity beta the firm would have if it used zero debt, adjusted upward by a factor that depends on the corporate tax rate and the amount of financial leverage employed. Therefore, the stock's market risk, which is measured by (β), depends on both the firm's business risk as measured by (β_u) and its financial risk by $(\beta - \beta_u) = \beta_u(1-T)\frac{D}{S}$.

These relationships can be used to help to estimate a company's cost of equity. In sum, the results is an estimate of the firm's equity beta given

its business risk as measured by the equity betas of other firms in the same line of business, and it's financial risk as measured by its own capital structure and tax rate.

2-3-3 Miller Model 1977:

Although MM included corporate taxes in their second model, they did not extend their work to include personal taxes. However, Merton Miller introduced a model designed to show how leverage affects firm's values when both personal and corporate taxes are taken into account.

With personal taxes included, and under the assumptions of MM models, the value of unlevered firm is found as follows:

$$V_U = \frac{EBIT(1-T_c)(1-T_s)}{K_{su}} \quad \text{.........}(2-8)$$

The $(1-T_s)$ term takes account for personal taxes. Therefore, the numerator shows how much of the firm's operating income is left after the unlevered firm pays corporate income taxes and its stockholders subsequently pay personal income taxes on their equity income, here personal taxes reduce the value of unlevered firm, other things held constant.

Miller results can be supported by dividing the levered firm's annual cash flows (CFL), into those going to the bondholders, and the stockholders after both corporate and personal taxes:

CFL= Net cash flows to stockholders + Net cash flows to bondholders.

$$CFL = (EBIT - I)(1 - T_c)(1 - T_s) + I(1 - T_d) \text{..........} (2-9)$$

Where:

I : Annual interest payment.

T_c : Corporate tax rate.

T_s : Personal tax rate on income from stocks.

T_d : Personal income tax rate from debt.

Equation (2-9) can be rearranged as follows:

$$CFL = EBIT(1 - T_c)(1 - T_s) - I(1 - T_c)(1 - T_s) + I(1 - T_d) \text{..........} (2-9-a)$$

The first term in equation (2-9-a) is identical to the after tax cash flow of unlevered firm as shown in equation (2-8). The second and the third terms, reflect leverage result from the cash flows associated with debt financing. Combining the present value of the three terms then:

$$V_L = \frac{EBIT(1 - T_c)(1 - T_s)}{K_{SU}} - \frac{I(1 - T_c)(1 - T_s)}{K_d} + \frac{I(1 - T_d)}{K_d} \text{..........} (2-10)$$

In equation (2-10), the first term is identical to the value of unlevered firm and rearranging equation (2-10), then:

$$V_L = V_U + \frac{I(1 - T_d)}{K_d}\left[1 - \frac{(1 - T_c)(1 - T_s)}{(1 - T_d)}\right] \text{..........} (2-10-a)$$

In equation (2-10-a), the term $\frac{I(1-T_d)}{K_d}$ equals market value of dcbt (D), and

then Miller model is:

$$V_L = V_U + \left[1 - \frac{(1-T_c)(1-T_s)}{(1-T_d)}\right] D..........(2-11)$$

The Miller model provides an estimate of the value of a levered firm in a world with both corporate and personal taxes.

The Miller model has several implications:

1. The term in bracket in equation (2-11), $\left[1 - \frac{(1-T_c)(1-T_s)}{(1-T_d)}\right]$ can be replaced by (T), then Miller model returns to the earlier MM model with corporate tax $(V_L = V_U + T * D)$.
2. If: $T_c = T_s = T_d = zero$, in this case equation (2-10) is the as the original MM model without corporate taxes.
3. If: $T_s = T_d = zero$, equation (2-11) is the same as MM model with corporate taxes.

2-4 Determinants of Capital Structure:

The relevant literatures on the determinants of capital structure provide a number of factors that have been examined. Titman and Wessels 1988[1] found that there is a relationship between debt levels, and the non-debt tax shield, volatility, transaction costs, and firm's growth. Jayant, Noe and Ramirez, 1991, conclude that the firm's risk, assets structure, capital expenditure, and advertising costs determine the firm's capital structure. Miguel, 2001, founds that investment, cash flows, and a financial distress cost affects the firm's debt policy. Al Najar 2003 founds that the firm's profitability, tax, liquidity, tangibility, dividends, size, and growth rate determine the firm's capital structure choice.

Therefore, there are several factors that affect the firm capital structure choice:

2-4-1 Size of the Firm[2]:

For the Static Trade-off approach, the larger the firm, the greater the possibility it has of issuing debt, resulting in a positive relationship between debt and size. One of the reasons for this is that the larger the firm the lower is the risk of bankruptcy. Large firms do not consider the

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1 Titman Sheridan, Wessels Roberto, " The determinants of capital structure choice ". Journal of finance, vol. 43, no.1, p. 1-19, march 1988.

2 Syed Tahir Hijazi, Yasir Bin Tariq, " Determinants of Capital Structure: A Case for the Pakistani Cement Industry ", The Lahore Journal of Economics, vol. 11, No.1, p.63-80, 2006. from the World Wide Web: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=892157

direct bankruptcy costs as an active variable in deciding the level of leverage as these costs are fixed by the Constitution and constitute a smaller proportion of the total firm's value and also because larger firms, being more diversified, have less chances of bankruptcy (Titman and Wessels 1988).

2-4-2 Profitability of the Firm[1]:

Due to the tax deductibility of interest payments, it is argued that highly profitable companies tend to have high levels of debt (Modigliani and Miller, 1963). However, Myers and Majluf (1984) argued that as a result of asymmetric information (pecking order hypothesis), companies prefer internal sources of finance. In other words, higher profitability companies tend to have lower debt levels and higher retained earnings. Relative to this theory, Kester, 1986, Titman and Wessels (1988), and Michaeles et al. (1999) find leverage to be negatively related to the level of profitability.

2-4-3 Firm's Tax Position[2]:

A major reason for using debt is that interest is a tax deductible expense, which lowers the effective cost of debt. However, if much of a

[1] Ghassan Omet&,Fadi Mashharawe, " The Capital Structure Choice in Tax Contrasting Environments: Evidence from the Jordanian, Kuwaiti, Omani and Saudi Corporate Sectors ", Conference paper, Faculty of Economics & Administrative Sciences, The Hashemite University, Amman, Jordan, p. 6.

[2] Eugene F. Brigham, " Essentials of managerial finance ", Thirteenth edition, United States of America, p. 379, 2005.

firm's income is already sheltered from taxes by accelerated depreciation or tax loss carryovers, its tax rate will be low, and debt will not be as advantageous as it would be to a firm with a higher effective tax rate.

2-4-4 Asset Structure[1]:

Firms whose assets are suitable as security for loans tend to use debt rather heavily. Thus, real estate companies tend to be highly leveraged. However, companies involved in technological research employ relatively little debt. Also, if the firm's assets are subject to high business risk, then the firm will be less able to use financial leverage than a firm with low business risk.

2-4-5 Growth Rate[2]:

Faster-growing firms must rely more heavily on external capital, slow growth can be financed with retained earnings, but rapid growth generally requires the use of external funds. For reasons set forth in our discussion of information asymmetry theory, and also because the flotation costs involved in selling common stock exceed those incurred when selling debt, firms first turn to debt financing to meet external funding needs. Thus, rapidly growing firms tend to use somewhat more debt than slower-growth companies.

1 Eugene F. Brigham, Louis C. Gapenski, " Financial management: theory and practice ", p.592.
1 Eugene F. Brigham, Louis C. Gapenski, " Financial management: theory and practice ", p. 592.

2-4-6 Earnings Volatility (Risk)[1]:

The trade-off theory suggests a negative association between risk and leverage as the probability of being unable to meet financial obligations increases with the volatility of earnings. This may result in arranging funds at high cost to service the debt or face the risk of bankruptcy. Hence as the present value of the costs of financial distress increases with the probability of being financially distressed, risky firms prefer less debt. Rather if a firm is financed by equity, it may choose not to pay dividends during periods of financial difficulties. Thus firms with highly volatile earnings borrow the least and prefer equity to debt. Baxter (1967) and Warner (1976) support the theory that the risk of bankruptcy affects capital structure of firms.

2-4-7 Firm's Liquidity Position[2]:

Firm's liquidity position may have a mixed impact on the firm's capital structure decision. First, the higher the liquidity ratio, the greater the ability of the firm to use debt due to its ability to meet its short-term obligation. On the other hand, firms with greater liquid assets may use these assets to finance their investments.

[1] Ushad Agathee Subadar, Mathew Lamport, Wassila Bhujoo-Hosany, " Theories of capital structure: evidence from investment and non-investment firms listed on the stock exchange of Mauritius ", University of Mauritius, p.6, from the World Wide Web:

http://academic-papers.org/ocs2/session/Pages/C4.pdf

[2] Mohammad al-Momani, " The effect of capital structure changes on firm value under different risk levels: evidence from Jordanian market ", p. 20.

These works reflects the importance of examining the effect of such determinants of capital structure when studying the relationship between capital structure and firm value.

Chapter Three

Literature Review

3-1 Introduction

3-2 Empirical Studies

3-3 The main Characteristics of this Study

3-1 Introduction

This chapter reviews previous literature conducted about the relationship between capital structure and firm value.

3-2 Empirical Studies:

Sarma and hanumanta (1967), the objective of their study was to employ the model of Miller and Modigliani to a non-regulated industry and test the MM hypothesis on the influence of debt on the value of the firm. They used a sample of thirty engineering companies from the Indian engineering industry and the years 1962, 1964 and 1965 were selected for the cross-section tests. The study used a multiple regression approach with the value of the firm as a dependent variable. The independent variables are the expected tax-adjusted earnings, the growth rate of tax-adjusted earnings, debt, size and fixed assets. They used the two-stage least-squares technique.

In the first stage they found that there is a positive relationship between the capital structure changes and firm value. While in the second stage they excluded the tax-shield from the value of the firm and concluded that there is no relationship between capital structure and the value of the firm and this conclusion supports MM hypothesis.

Masulis (1983) measured the impact of capital structure changes on firm value using a sample of one hundred and thirty three firms listed in New York Stock Exchange (NYSE) and Australian Stock Exchange (ASE) during the period from 1963 to 1978. The study used a multiple regression model with the primary announcement period stock return as a dependent variable and the major independent variables are changes in leverage multiplied by senior security claims outstanding and changes in debt tax-shields. The main result of the study is that both stock prices and firm values are positively related to changes in debt level and leverage.

Pinegar and Lease (1986) examined the impact of preferred-for-common stock exchange offer on firm value for a sample consists of thirty seven firms listed in New York Stock Exchange (NYSE) and Australian Stock Exchange (ASE) over the period from 1962 to 1980. They used a two-stage regression approach. In the first stage, they used a regression model with the change in firm value proxied by the announcement period return as a dependent variable, the independent variables are the change in preferred stock liquidation values and the dummy variables which reflects the conversion privileges, voting rights, protective covenants and retained earning. In the second stage they substituted the change in the dividends commitments for the change in preferred stock liquidation values. The

study found that a systematic change in firm value occurs when companies announce preferred-for-common exchange offers.

Connell and Servaes (1995) aimed to find the relationship between the selection of debt financing or equity financing through studying the value of the firm, financial leverage and stock ownership. They employed a sample of one thousand one hundred and seventy three firms in 1976, one thousand and ninety three firms in 1982 and eight hundred thirty firms in 1988 which were listed in NYSE. They divided the sample into two sub samples; high-growth and low-growth firms. The study concluded that the correlation between the value of the firm and leverage is positive for low-growth firms and negative for high-growth firms.

Gordon (2001) examined how financial engineering of the liabilities enhances company value. He found that splitting a fund into some mix of shares relating to debt, dividends and capital adds about 10% to company value, because split-capital funds trade at much smaller discounts than conventional funds. Analyses of cross-section and time-series data reveal that there are two approximately equal sources of the extra value. The first (worth 4.7%) arises simply from having a wind-up date, which forces the discount to converge to zero over time. The second (worth 4.6%) comes from being levered with zero-dividend preference shares. Of this leverage

effect, about one third is attributable to a tax shield and two thirds to a clientele effect. An option-evaluation of the ordinary (capital) shares indicates that they contribute more than half of the extra value of split funds relative to conventional funds, although they are frequently mispriced. Hence the split-capital structure enhances company value because: (1) there is a clientele effect for debt (indicating that the debt market is imperfect); (2) there is a tax shield to be exploited; and (3) limiting company life constrains managers to make an eventual sale at net asset value.

Kaifeng (2002) empirically examined the influence of capital structure on the company value given different growth opportunities. The sample includes one hundred and twenty seven firms incorporated in the Netherlands at the end of March 2001. He used the price to equity ratio to differentiate the sample to high-growth firms and low-growth firm's sub samples. The study applied the multiple regression approach with the firm value measured by Tobin's *Q* as a dependent variable. The independent variable is total debt to assets ratio. The control variables are pre-tax profit margin ratio, tax rate, capital expenditures ratio and total assets. The regression model is preformed for the two sub samples. He found that in the low-growth firms sub sample, the relationship between the capital

structure and the value of the firm is positive and significant while in the high-growth firms sub sample, the relationship is positive but insignificant.

Carpentier, L'her and Suret (2002) aimed to analyze the long term relationship between changes in capital structure and the value of the firm for a sample of two hundred and forty three non-financial French firms over the period from 1987 to 1996. The study used a multivariate parametric model with the change in firm value proxied by the growth rate of market-to-book ratio as a dependent variable. The independent variable is the change in leverage. The control variables are the growth rate of total assets and the mean profitability ratio. They use the multiple regression models in two stages, in the first stage they found that there is no significant relationship between changes in leverage and changes in firm's value, in the second stage they included a dummy variable which reflects the reversion towards the target debt ratio as a dummy variable and found that there is a lack of significant relationship between changes in capital structure with respect to the target ratio and change in the value of the firm.

Abbad (2003) examined the impact of capital structure on the profitability and firm value. The sample consists of twenty five firms taken from the industrial sector and listed on the Amman Stock Exchange over the period from 1991 to 2000. Two multiple regression models were used.

The first model was used to examine the relationship between the firm's profitability and capital structure with the firm's profitability measured by the profit margin ratio as a dependent variable. The independent variables are the firm's capital structure and firm's size. The result indicated existence of negative and significant relationship between firm's profitability and capital structure. The second model was used to investigate the relationship between capital structure and firm value with a value proxied by market-to-book ratio as a dependent variable. The independent variables are the firm's capital structure, firm's size, corporate tax rate and earning before tax. He found that there is a positive and significant relationship between the value of the firm and its capital structure.

Oraluck and Ariff (2004) investigated the impact of the relative capital structure on the firm value. They used a sample consists of six hundred and thirty nine observations taken from companies listed in Australian stock exchange during the period from 1991 to 2003. The study used a multiple regression approach with the firm value proxied by three days cumulative average return (CAR) as a dependent variable. The directional changes in the capital structure relative to the industry median debt ratio are independent dummy variables. The study concluded that

there is a significant change in firm's value when the relative capital structure changes by 10-40 percent.

Eldomiaty (2004) examined the relationship between the changes in firm's capital structure and their effects on firm's market value under three different levels of systematic risk; high, medium, and low. The sample consists of ninety nine firms which they cover fourteen different non-financial industries in Egypt Stock Exchange (ESE) for the period from 1994 to 2001. He was then divided the firms included in the sample into three groups: firms with high, medium and low beta. The study used a multiple regression approach with the change in the firm's value measured as the number of shares outstanding multiplied by the current closing price at the date of financial statement preparation as a dependent variable. The independent variables are the change in firm's capital structure, the change in firm's profitability, the change in firm's liquidity, firm's growth, firm's size, in addition to fourteen variables cover relatively the trade-off theory, pecking order theory and free cash flow theory. The main result of the study is that the relationship between capital structure changes and firm value is negative and statistically significant for high-risk firms, while for the low-risk and medium-risk firms it is negative but insignificant.

Al-Momani (2006) investigated the impact of capital structure changes on firm value under different levels of systematic-risk. He used a sample of seventy non-financial companies listed and traded in Amman Stock Exchange over the period from 1998 to 2004. The firms included in his study were classified into three groups: firms with high, medium, and low beta. Using an ordinary least square regression to analyze the data, the results indicated that change in firm's capital structure has a statistically significant negative effect on changes in firm's market value for the high-risk and low-risk firms only. The study recommended that the non-financial Jordanian companies, with respect to their systematic risk, should take into consideration the main factors that are found significant by the study to affect their market value.

Feng-Li and Tsangyao (2009)[1], analyzed whether leverage affects firm value and does so using a panel of one hundred ninety six Taiwanese listed companies from 1993 to 2005. They employ an advanced panel threshold regression model to test whether there is a "threshold" debt ratio which causes there to be asymmetrical relationships between debt ratio and firm value. They adopt Tobin's Q as proxy for firm value. They found that there are two threshold effects between debt ratio and firm value, and these are 9.86% and 33.33%.When the debt ratio is less than 9.86%, Tobin's Q

[1] http://www.informaworld.com/smpp/content~db=all~content=a909099322

increases by 0.0546%, with an increase of 1% in the debt ratio. When the debt ratio is between 9.86% and 33.33%, they find Tobin's Q increases by only 0.0057%, with an increase of 1% in the debt ratio. But when the debt ratio is greater than 33.33%, there is no relationship between debt ratio and firm value.

3-3 The Main features of this Study:

This study aims to test empirically the effect of capital structure on the value of non-financial services companies listed in Amman Stock Exchange during the recent period, from 1998 to 2007.

Most prior studies conducted about the effect of capital structure on the firm value have used one measure of capital structure, either the ratio of total debt to total assets (Rajan and zingales 1995, Kaifeng 2002), or the ratio of total debt to total equity (Nikolas 2002, Oraluck and Ariff 2004), while in our study we use these two ratios as a measurement of capital structure. We used also two measures of the firm profitability which are the return on assets, and return on equity.

This study addressed the most factors that would affect the capital structure such as the size of the company, tax rate, the company's growth, and profitability of the company, which may in turn affect the value of the company, while we find that most previous studies have focused most attention on the impact of debt on the value of the company.

This study concerns the non-financial services sector, which contains several branches, including: communication services, transportation, tourism, education, media services, utilities, commercial services…etc, while most studies on the relationship between capital structure and firm value focused their attention on the industrial sector, and some study have

been mixed between the two sectors such as the study conducted by Al Momani.

What distinguishes this study from previous studies?

This study differs from the one that conducted by Al Momani (2006) on the effect of capital structure changes on firm value under different risk levels: evidence from Jordanian market, in the following points:

- One of the variables in this study whose their effect have been tested on the company's value, is the income tax, because of its importance when studying the impact of capital structure on the value of the firm, while Al momani have not tested the effect of this variable. He tested the impact of other variable which is the liquidity of the firm on its value, such variable has been not tested in this study.
- We use in our study two measures of capital structure which are the ratio of total debt to total assets, and the ratio of total debt to total equity, while Al Momani have used just the ratio of total debt to total assets, in other hand, we use the return on equity and return on assets as a measurement of the firm profitability, Al Momani used the return on assets as a proxy of firm profitability.
- This study focuses on one sector, consists of non-financial services companies listed in ASE, while Al Momani have had mixed between the industrial sector and service sector, this leads to influence the

obtained findings as a result of the difference in capital structure of the industrial company from that of services company. This is manifested through the descriptive statistics for variables used in Al momani study. For change in market value, the mean was 1819256, the maximum value was 42240000, and the minimum value was (2640000) with a STD of 6924939. For the growth in total asset, the mean was 7.51725, the maximum value was 110.3049, and the minimum value was (43.25) with a STD of 30.98.

- The ASE has recently introduced a new sectoral classification for companies listed at the stock exchange (July 2006)[1]. The classification is in line with international standards and provides a clearer picture about listed companies in order to help investors make their investment decisions.

In order to apply this classification on listed companies, the ASE had studied the international standards applicable in this field, as well as the sectoral classification adopted by some Arab and international stock markets, after which the classification used by the standard & poor's (S&P's) was adopted with some minor modifications that render them suitable for the nature of Jordanian companies.

Pursuant to this classification, listed companies are classified in three major sectors: the financial sector that includes banks, insurance,

[1] http://www.ase.com.jo/en/node/294

financial services, real estate and investment companies; the services sector that includes companies operating in the field of health care sector, education, energy, transportation, tourism and communications; and the industrial sector that includes companies operating in the field of mining and extraction industries, engineering and construction, food and beverages, tobacco, textiles, leather and clothing, ceramics and electrical industries.

This classification has many advantages. It helps show the nature and objectives of the companies more clearly and more accurately to investors, which will in turn facilitate the analysis of the company's financial statements and comparing it to companies of such and with the sector it belongs to. Moreover, investors will be able to follow changes in shares prices of the various sectors using the indices that the ASE has calculated for each major sector and sub-sector.

We follow in our study the new sectoral classification for ASE. While Al momani followed the old classification of sector in Amman stock exchange, where the financial services, real estate and investment companies have classified into service sector, so, he introduced such companies in his study sample such as: National portfolio securities, Jordanian expatriates investment holding, Arab financial investment, United for financial investment, Union investment corporation, Real estate investment (Akarco).

- Al Momani study investigated the effect of capital structure changes on firm value under three levels of systematic risk, firms with high, medium, and low beta, while in our study, the risk is not taken into consideration.
- Difference in the test period, our study covers ten years from 1998 to 2007, while Al Momani study covered seven years from 1998 to 2004.

Chapter Four

Methodology

4-1 Introduction

4-2 Population of the Study

4-3 Sample of the Study

4-4 Data Collection

4-5 Hypotheses of the Study

4-6 Model of the Study

4-7 Measurement of Variables

- 4-7-1 Dependent Variable
- 4-7-2 Independent Variables

4-1 Introduction:

This chapter discusses the methodology used to investigate the effect of capital structure on non-financial services companies listed in ASE during the period from 1998 to 2007. The first part explains the population, sample and data collection. The second part presents the hypotheses of the study. The third part presents the model used to test the hypotheses. The fourth part provides a brief explanation about the variables under investigation and their measurements.

4-2 Population of the Study:

The population of this study includes all non-financial services companies listed in ASE during the period from 1998 to 2007.

4-3 Sample of the Study:

The sample of this study consists of all non-financial services companies listed in ASE during the period from 1998 to 2007, and which satisfied the following criteria:

- The selected companies should have lasted from 1998 to 2007.
- The selected companies should have reported their annual accounts over the period of the study.
- Companies that were merged with another company over the period from 1998-2007 were excluded from the sample.

- Information about selected companies should be available in order to test the variables of the study.

The sample is eighteen non-financial services companies.

4-4 Data Collection:

The data related to firm's financial statements (income statement and balance sheet items) were collected from the firm's annual reports. The number of shares outstanding and price per share were obtained from the Jordanian shareholding companies guide and CD-rom published by ASE.

The information about the subject of this study was collected from books, thesis, articles, web site, and other sources related to the subject of this study and help in developing hypothesis and analyzing data.

4-5 Hypotheses of the Study:

The main hypotheses of this study are:

H_0: There is a statistically insignificant relationship between capital structure and firm value.

H_1: There is a statistic ally significant relationship between capital structure and firm value.

In addition, this study tests the following sub hypotheses:

H_2: There is a statistically significant relationship between firm's profitability and firm's value.

H_3: There is a statistically significant relationship between firm's growth and firm's value.

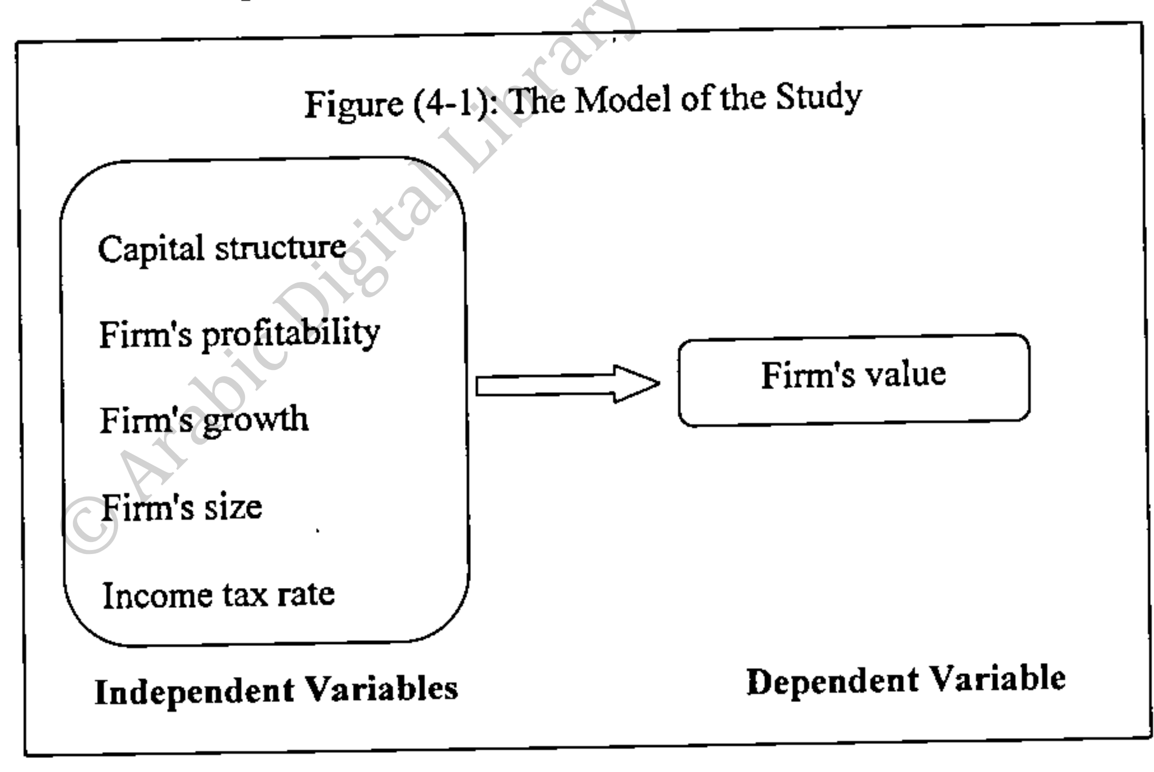
H_4: There is a statistically significant relationship between firm's size and firm's value.

H_5: There is a statistically significant relationship between income tax rate and firm's value.

4-6 The Model of the Study:

To test the hypotheses of this study, we used the model represented in the following figure:

Figure (4-1): The Model of the Study



This study used the multiple regression analysis to examine the relationship between the dependent variable and several independent variables (Eldomiaty, 2004). The multiple linear regression equation takes the following form:

$$V = \beta_0 + \beta_1 (CS) + \beta_2 (ROA) + \beta_3 (G) + \beta_4 (S) + \beta_5 (T) + \varepsilon i$$

Where:

V: The value of the firm.

CS: Capital structure, proxied by total debt to total assets ratio.

ROA: Profitability of the firm (return on assets).

G: Growth rate of the firm.

S: Size of the firm, which is proxied by the natural logarithm of total assets.

T: income tax rate.

While:

β_i: Coefficient values.

εi: Error term, it represents that part of the firm's value which change randomly as a result of other factors not included in the model.

4-7 Measurement of Variables:

The following section provides the measurement of the variables of this study.

4-7 -1 Dependent Variable:

- **Firm's value:**

Firm's value is one of the fundamental metrics used in business valuation, financial modeling, accounting, portfolio analysis, etc. This variable is proxied by the number of shares outstanding multiplied by price per share (Eldomiaty, 2004).

4-7 -2 Independent Variables:

- **Firm's capital structure:**

Capital structure is measured by the total debt ratio which is the ratio of total debt to total assets (kaifeng, 2002).

- **Firm's profitability:**

The profitability of the firm is proxied in this study by the return on assets which is the ratio of net income to total assets.

- **Firm's growth:**

The growth of total assets measured as a percentage change in total assets from year to year (Carpentier, L'her and Suret, 2002) is used in this study.

- **Firm's size:**

There are many standards that are used to measure this variable, such as: sales volume, the total fixed assets, and the sum of total assets. Firm's size is measured in this study with the natural logarithm of total assets. (Kaifeng Chen, 2002 and Eldomiaty, 2004).

- **Income tax rate:**

This variable is used in the study conducted by Kaifeng in 2002 about the Influence of Capital Structure on Company Value with different growth opportunities, it is measured as follow:

$$T = \frac{EBT - NI}{EBT}$$

Where:

EBT: earning before tax.

NI: earning after tax.

Chapter Five

Data Analysis

5-1 Introduction

5-2 Descriptive Statistics

5-3 Testing the Hypotheses of the Study

5-3-1 Correlation Analysis

5-3-2 Regression Analysis

5-1 Introduction

As mentioned earlier, this study aims to test the effect of capital structure on value of the non-financial services companies listed in ASE during the period from 1998 to 2007 in the light of some variables which are: The value of the firm (V), Capital structure (CS), Profitability of the firm (ROA), Growth of the firm (G), Size of the firm (S), and Income tax rate (T).

After gathering necessary data from the financial statements of the sample companies and the Jordanian shareholding companies guide such as: total assets, total debt, shareholders equity, net income, number of shares outstanding …etc, they were analyzed by Excel and the variables were calculated. Then the variables have been entered in SPSS software, and they have been treated.

So, this chapter is organized as follow: The first part provides the descriptive statistics for the variables of the study. The second part explains how the data was analyzed in order to test the hypotheses of the study.

5-2 Descriptive Statistics:

This section provides the descriptive statistics for the variables used to examine the effect of capital structure on the value of the firm (Independent variables and dependent variable). The sample consists of eighteen non-financial services companies listed in Amman Stock Exchange. The sample has one hundred and eighty observations from 1998 to 2007.

Table (5-1): Descriptive Statistics for the Study Variables (1998 – 2007)

Variables	Mean	Std. Deviation
V	9423353	18178937
CS	0.33170	0.24810
ROA	0.0442	0.0801
G	0.12160	0.71360
S	16.8748	1.2185
T	0.11460	0.17630

Source: Using SPSS.

Table (5-1) shows the means and standard deviations for the values of independent variables and dependent variable for the period (1998 – 2007). The mean for the capital structure (CS) is 0.33170 with a Standard Deviation of 0.24810, which means that the non-financial services companies listed in ASE include debt in their capital structure; while the

mean for the profitability of the firm (ROA) is 0.0442 with a Standard Deviation of 0.0801. It is the last dispersed one among the independent variables; the mean for the growth of the firm (G) is 0.12160 while the Standard Deviation is 0.71360; for the size of the firm (S), the mean is 16.8748 and the Standard Deviation is 1.2185; finally, the mean for the income tax rate (T) is 0.1146 with a Standard Deviation of 0.17630.

To perform the statistical measurements, we calculated the logarithm for the values of the firm value (V), and then calculated the means and standard deviations. The results are shown in table (5-2).

Table (5-2): Descriptive Statistics for the firm value using the logarithm (1998 – 2007).

Variables	Mean	Std. Deviation
LOG_V	6.2425	0.9937

Source: Using SPSS.

From table (3), the mean for the value of the firm (V) is 6.2425 with a Std.Deviation of 0.9937;

5-3 Testing the Hypotheses of the Study:

The objective of this study is to empirically investigate the impact of capital structure on firm value. To do that, we use the correlation analysis in order to examine the relationship between capital structure and firm

value, and use the regression analysis and F test to find the causality relationship between the dependent variable and independent variables.

5-3-1 Correlation Analysis:

This part is concerned with revealing the correlation between the variables of the study. We used Pearson correlation test which gives the idea about the direction and the strength of the relationship between the variables of the study and how a change in the independent variables affects the dependent variable.

Table (5-3) shows the Pearson correlation coefficients between the dependent variable and the independent variables.

Table (5-3): Pearson correlation coefficient value

Variables	Statistical Measurements	LOG_V	CS	ROA	G	S	T
LOG_V	Pearson Correlation	1.000	-.067	**.366****	**.149****	**.306****	.089
	Sig. (2-tailed)	.	.374	.000	.045	.000	.232
	N	180	180	180	180	180	180
CS	Pearson Correlation	-.067	1.000	**-.314****	**.192****	**.603****	.074
	Sig. (2-tailed)	.374	.	.000	.010	.000	.320
	N	180	180	180	180	180	180
ROA	Pearson Correlation	**.366****	**-.314****	1.000	.054	.066	.053
	Sig. (2-tailed)	.000	.000	.	.469	.377	.482
	N	180	180	180	180	180	180
G	Pearson Correlation	**.149****	**.192****	.054	1.000	**.146****	.023
	Sig. (2-tailed)	.045	.010	.469	.	.050	.756
	N	180	180	180	180	180	180
S	Pearson Correlation	**.306****	**.603****	.066	**.146****	1.000	.006
	Sig. (2-tailed)	.000	.000	.377	.050	.	.932
	N	180	180	180	180	180	180
T	Pearson Correlation	.089	.074	.053	.023	.006	1.000
	Sig. (2-tailed)	.232	.320	.482	.756	.932	.
	N	180	180	180	180	180	180

** Significant at 5% level.

From table (5-3), there is a positive and statistically significant relationship at Pearson significance level (P-value) equal to 0.05, up to 36.6% between V and ROA, 14.9% between V and G, and 30.6% between V and S. Also, there is a positive correlation between V and T but it is statistically insignificant at P-value equal to 0.05. While the correlation between V and CS is negative and statistically insignificant, therefore, we can not depend on it to explain the variation in the value of the firm, and this is consistent with the null hypothesis which states that there is no statistically significant relationship between the two variables.

❖ **Testing the Issue of Multicollinearity:**

Because of the correlation between the independent variables, this study examined the possibility of multicollinearity within the variables, which might affect the ability to interpret the results and determine the role played by each variable in the regression model. Table (5-4) represents the variance inflation factor (VIF).

Table (5-4): Variance Inflation Factor (VIF)

Independent variables	VIF
CS	2.048
ROA	1.282
G	1.054
S	1.785
T	1.019

The VIF in the table does not exceed five, and this suggests that there is no multicolinearity within the variables.

5-3-2 Regression Analysis:

For the reason of testing the hypothesis, we will use the variance analysis (F-Test), the null hypothesis (H_0) will be rejected and accepted the alternative hypothesis (H_1) if the significant level (P-value) is equal to or less than the significant level at (α=0.05).

- **ANOVA regression analysis:**

Table (5-5): ANOVA regression analysis

Source	Sum of Squares	df	Mean Square	F	R^2	Sig.
Regression	46.117	5	9.223	12.822	0.269	.000
Residual	125.166	174	.719			
Total	171.283	179				

From table (5-5), the significance of the model (P-value) is (0.000), and since it is less than the significant level (0.05), the null hypothesis (H_0) is rejected, so, at least one of the independent variables can explain the dependent variable (the value of the firm).

The explanatory power (R^2) equal to 0.269, which means that the independent variables explain 26.9 % from the dependent variable.

❖ **Coefficients of the regression model:**

Table (5-6) represents the coefficients, t-test, and the significant level (P-value) for the independent variables.

Table (5-6): Coefficients of the regression model

Independent Variables	Un-standardized Coefficients		Standardized Coefficients	t- value	Sig.
	β	Std. Error	Beta		
(Constant)	-.126	1.187		-.106	.916
CS	-1.172	.366	-.297	-3.206	.002
ROA	2.816	.896	.231	3.144	.002
G	.172	.091	.126	1.893	.060
S	.397	.076	.451	5.207	.000
T	.015	.010	.094	1.431	.154

- Significant at ($\alpha = 0.05$).

According to the previous results, the equation model will be as follows:

$$V = -0.126 - 1.172(CS) + 2.816(ROA) + 0.172(G) + 0.397(S) + 0.015(T)$$

Table (5-6), and the regression equation shown that there is a negative relationship between the value of the firm and the capital structure (CS) and it is statistically significant at P-value equal to 0.05, this suggest that the extensive use of debt affects the value of the firm negatively which indicates that the firms are not able to realize the benefit of debt financing

(tax savings). Therefore, the null hypothesis (H_0) is rejected. So, there is a statistically significant negative relationship between capital structure and the value of the firm, this result is not consist with the result obtained by (Kaifeng, 2002), but it consists with the result obtained by (Eldomiaty, 2004) for high systematic risk firms. The relationship between the value of the firm and the profitability of the firm (ROA) is positive and it is statistically significant at the same level of significance. Also, the relationship between the value of the firm and the size of the firm (S) is positive and it is statisticaly significant at (P-value) equal to 0.05, which means that the firms use their total assets effectively to increase their value, this result consist with the study of (Kaifeng, 2002). Finally, the relationship between the value of the firm and firm's growth, and between the firm value and income tax rate are statistically insignificant, so, the hypotheses (H_3, H_5) will be rejected.

Regression Stepwise Models:

We use a stepwise regression model, in order to determine the most influential variable on the value of the firm. Table (8) show that.

Table (5-7): Regression Stepwise Models

Model	Independent Variables	Un-standardized Coefficients		t	Sig.
		ß	Std. Error		
1	(Constant)	6.061	.078	77.830	.000*
	ROA	4.464	.852	5.242	.000*
2	(Constant)	1.911	.983	1.944	.053
	ROA	4.235	.816	5.193	.000*
	S	.2490	.059	4.233	.000*
3	(Constant)	-0.027	1.196	-.023	.982
	ROA	3.145	.894	3.517	.001*
	S	.3880	.077	5.050	.000*
	CS	-0.991	.361	-2.743	.007*

- Significant at ($\alpha = 0.05$).

The most influential independent variable on the value of the firm is the profitability of the firm (ROA), followed by the size of the firm (S), and finally the capital structure (CS).

❖ To make sure of the negative relationship between the capital structure and the value of the firm, we re-calculate the capital structure using the ratio of total debt to total equity. And to make sure of the positive relationship between the profitability of the firm and the value of the firm, we used the return on equity (ROE) as a proxy of the firm profitability instead of the return on assets (ROA).

From the ANOVA regression analysis when using the ratio of total debt to total equity as a measurement of capital structure, and the return on equity as a measurement of firm's profitability, the significance of the model (P-value) was (0.000), and since it is less than the significant level (0.05), the null hypothesis (H_0) is rejected, so, at least one of the independent variables can explain the dependent variable (the value of the firm).

The explanatory power (R^2) equal to 0.275, which means that the independent variables explain 27.5 % from the dependent variable, this value is near of the latest when used the ratio of total debt to total assets as a proxy of capital structure and the ROA as a proxie of firm's profitability.

The regression coefficient for the capital structure was (-0.117), this result confirms the negative relationship between the capital structure and the firm value (and it is statistically significant), while the regression coefficient for the return on equity (ROE) was (1.975), so, there is a

positive relationship between the firm value and ROE and it is statistically significant, this confirms the positive relationship between the firm value and the firm's profitability.

Chapter six

Conclusions and Recommendations

6-1 Conclusions

6-2 Recommendations

6-1 Conclusions:

This study uses a multiple regression analysis to investigate the effect of capital structure on the value of the non-financial services companies listed in Amman Stock Exchange during the period from 1998 to 2007. Where the dependent variable is value of the firm, and the independent variables are: capital structure, profitability of the firm, growth of the firm, size of the firm, and income tax rate.

The results of this study are summarized as follows:

- There is a statistically significant negative relationship between the value of the firm and the capital structure of the non-financial services firm in ASE, which indicates that the firms are not able to realize the benefit of debt financing (tax savings). We used two measures of capital structure which are the ratio of total debt to total assets, and the ratio of total debt to total equity, to confirm the negativity of the relationship between the capital structure and the firm value.
- There is a statistically significant positive relationship between the value of the firm and the profitability of the firm (return on assets, and return on equity).
- There is a statistically significant positive relationship between the value of the firm and the size of the firm.

- There is a statistically insignificant relationship between the value of the firm and the firm's growth, and between the firm value and the income tax rate.

6-2 Recommendations:

Based on the results of this study, we recommend the following:

- ❖ Non-financial services companies listed in Amman Stock Exchange should take into consideration the factors that determine their value, such as capital structure, firm's profitability (ROA, ROE), and firm's size.
- ❖ The analysis could be improved by differentiating between types of debt such as long-term and short-term debt.
- ❖ Non-financial services companies listed in Amman Stock Exchange should use the tax saving effectively in order to raise their market value.

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Appendix

List of sample companies

Company name	Company Symbol
AL AHLIA ENTREPRISES	ABLA
AL-SHARQ INVESTMENTS PROJECTS	AIPC
AL-ZARQA EDUCATIONAL & INVESTMENT	ZEIC
ARAB INTERNATIONAL HOTELS	AIHO
INTERNATIONAL COMPANY FOR MEDICAL INVESTMENT	ICMI
IRBID DISTRICT ELECTRICITY	IREL
JORDAN ELECTRIC POWER	JOEP
JORDAN EXPRESS TOURIST TRANSPORT	JETT
JORDAN HOTELS & TOURISM	JOHT
JORDAN INTERNATIONAL TRADING CENTER	JITC
JORDAN NATIONAL SHIPPING LINES	SHIP
JORDAN PRESS & PUBLISHING(AD-DUSTOUR)	JOPP
JORDAN PRESS FOUNDATION AL-RA'I	PRES
JORDAN TRADE FACILITIES	JOTF
SPECIALIZED JORDANIAN INVESTMENT	SIJC
THE ARAB INTERNATIONAL FOR EDUCATION & INVESTMENT	AIEI
UNIFIED TRANSPORT & LOGISTICS	UNIF
ZARA INVESTMENT HOLDING	ZARA

Source: www.ase.jo.com

ملخص

أمينة حمادة. أثر هيكل رأس المال على قيمة الشركة: دراسة ميدانية على شركات الخدمات غير المالية المدرجة في سوق عمان المالي 1998-2007. رسالة ماجستير، قسم العلوم المالية والمصرفية، جامعة اليرموك. 2010 (المشرف: أ.د علي. ح. المقابلة).

في سياق تمويل الشركات، استخدام الدين ينتج عنه وفر ضريبي، هذا يعني أنه من الأفضل للشركات التمويل بالدين بدلا من الملكية، لكن هناك خطر كبير مرتبط مع نسبة عالية من الديون يتمثل في العسر المالي والإفلاس، لذلك يجب على الشركات اختيار هيكل رأس المال الأمثل الذي من شأنه رفع قيمتها السوقية.

هدفت هذه الدراسة إلى معرفة أثر هيكل رأس المال على قيمة الشركة، وقد استوفت العينة ثمانية عشرة شركة خدمات غير مالية مدرجة في سوق عمان المالي لعقد من الزمن 1998 - 2007.

وقد استخدم نموذج الانحدار الخطي المتعدد لدراسة العلاقة بين المتغير التابع الذي يمثل قيمة الشركة، والمتغيرات المستقلة والتي تمثل، هيكل رأس المال، ربحية الشركة، نمو الشركة، حجم الشركة، و معدل ضريبة الدخل.

وأشارت النتائج إلى وجود علاقة سلبية ذات دلالة إحصائية بين قيمة الشركة وهيكل رأس المال ، وهذا يشير إلى أن الاستخدام المكثف للديون يؤثر سلبا على القيمة السوقية للشركة، الأمر الذي يعني أن هذه الشركات ليست قادرة على تحقيق الفوائد المرجوة من استخدام الدين. كما أظهرت النتائج وجود علاقة إيجابية وذات دلالة إحصائية بين قيمة الشركة وحجم الشركة مما يشير إلى أن الشركة تستخدم مجموع أصولها بشكل فعال لزيادة قيمتها.

توصي الدراسة شركات الخدمات غير المالية المدرجة في سوق عمان المالي، الأخذ بعين الاعتبار العوامل التي من شأنها أن تؤثر على قيمتها السوقية.

الكلمات الدالة: هيكل رأس المال، قيمة الشركة، شركات الخدمات غير المالية ، سوق عمان المالي.